USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE
National Technology & Development Program

Specification 5100-84D
CANTEEN, WATER, POLYETHYLENE, 1-QUART

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Record of Revisions

Date	Revision summary
11/3/2022	3.2.1.1 Description of body color
11/3/2022	3.2.1.3 Addition of canteen cap liner material description
11/3/2022	3.3.3 Addition of canteen cap liner design and construction
11/3/2022	3.3 Addition of canteen cap assembly
11/3/2022	Globally reflect drawing number change, NTDP-1176

1. SCOPE

This document covers a plastic water canteen body and canteen cap assembly having a nominal capacity of 1 quart.

1.1. Interpretations and Definitions.

1.1.1. Interpretation.

To carry out the provisions of this document, the word “shall” is understood to be mandatory.

1.1.2. Definitions.

Nonconformity: A departure of a quality characteristic from its intended level or state that occurs with severity sufficient to cause an associated product or service not to meet a specification requirement (per ANSI/ASQ Z1.4).

2. APPLICABLE DOCUMENTS

2.1. Government documents.

Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein. Unless otherwise indicated, copies of federal and military specifications and standards are available online at https://quicksearch.dla.mil/qsSearch.aspx or in hardcopy from the Standardization Documents Order Desk, Building 4D, 700 Robbins Ave., Philadelphia, PA 19111-5094. Copies of USDA Forest Service specifications are available from the preparing activity, 6.6.

2.1.1. Federal and Military Specifications and Standards,

2.1.1.1. MILITARY

MIL-STD-129 – Military Marking for Shipment and Storage

2.1.1.2. USDA Forest Service

Drawing NTDP-1176– Canteen, Water, Polyethylene, 1-Quart

2.1.2. Other government documents Law and Regulations

2.1.2.1. U.S. Department of Health and Human Services

Copies are available from the Federal Trade Commission, Public Reference Branch, 6th St. and Pennsylvania Ave. NW, Washington, DC 20580-0001.

Federal Food, Drug, and Cosmetic Act and Regulations Promulgated Thereunder

2.2. Non-Government publications.

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those in effect on the date of the invitation for bids or request for proposals.

2.2.1. AMERICAN SOCIETY FOR QUALITY (ASQ)

Z1.4 – Sampling Procedures and Tables for Inspection by Attributes

Copies are available from the American Society for Quality, PO Box 3005, Milwaukee, WI 53201-3005, www.asq.org.

2.2.2. ASTM

D 1974 - Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes

D 4976 – Standard Specification for Polyethylene Plastics Molding and Extrusion Materials

D 3951 - Standard Practice for Commercial Packaging

D 5118 - Standard Practice for Fabrication of Fiberboard Shipping Boxes

Copies are available from ASTM International, 100 Barr Harbor Dr., West Conshohocken, PA 19428- 2959, www.astm.org.

2.2.3. National Motor Freight Traffic Association, Inc., Agent

National Motor Freight Classification

Address requests for copies to the American Trucking Association, Inc., Traffic Department, 1616 P St. NW, Washington, DC 20036.

Non-Government standards and other publications normally are available from the organizations that prepare and distribute the documents. These documents also may be available in or through libraries or other informational services.

2.3. Order of precedence.

In the event of conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1. First article.

Unless otherwise specified (see 6.2), the contractor shall furnish three completed units for first article inspection and approval (see 4.3 and 6.4). During the term of the contract the contractor shall be required to notify the contracting officer in writing when a component, or the component supplier, changes in any way; when a major manufacturing process changes in any way; and when a manufacturing location changes. The contracting officer may at any time require the contractor to submit a new first article sample when substantive changes occur during the term of the contract.

3.2. Materials (see 6.5).

3.2.1. Polyethylene and polypropylene.

The polyethylene and polypropylene used in the manufacture of the canteen body and the canteen cap assembly (canteen cap and canteen cap liner), and the antioxidants or other substances incorporated in the plastic shall conform to the Food, Drug, and Cosmetic Act requirements for use in contact with drinking water. The finished canteen shall impart no objectionable odor and shall impart no noticeable taste when tested in accordance with 4.4.4.1.

3.2.1.1. Canteen Body material.

The canteen body shall be made from high density (homopolymer) virgin polyethylene conforming to class 3 or 4, grade 3 of ASTM D 4976. Clean, unburned material in the form of imperfect parts, tails, neck flash or other scrap of the same composition as the virgin material and produced in the molding or finishing operation may be reground and mixed with the virgin material. When reground is mixed with the virgin material, the reground shall not exceed a level of 35 percent by weight of the blended mixture. The color shall be natural with no pigment added.

3.2.1.2. Canteen Cap material.

The canteen cap shall be manufactured from food-grade polypropylene. The canteen cap shall contain a polyethylene liner as specified in 3.2.1.3. The cap color shall be white.

3.2.1.3. Canteen Cap Liner material

The canteen cap liner material shall be made of food-grade foamed polyethylene and solid polyethylene. The color shall be white.

3.3. Design and construction.

The canteen body and canteen cap assembly shall conform in all respects to Drawing NTDP-1176 and as specified herein (see 6.3).

Canteen Body.

The body shall be blow molded in high density homopolymer polyethylene as specified in 3.2.1.1 and by a process in which the body is blown and molded in one piece, and not as a result of a sheet forming operation. The lip of the body neck which forms the sealing surface against the cap assembly shall be flat, smooth, and free from sink marks and depressions or other nonconformities which may affect proper sealing. The canteen neck shall be threaded for a minimum of one full turn. The threads shall be fully formed and free from flash and thread misalignment. All parting lines shall be free from flash except that flash extending not more than 1/32 inch at the bottom pinch-off area shall be permitted. There shall be no interference upon engagement of the cap to its fully seated position. The body shall be blow molded in such a manner that the material shall be distributed to conform to the interior and exterior shape, weight and general overall design as shown in Drawing NTDP-1176. The body shall weigh 55 ± 2 grams and shall have a minimum wall thickness of 0.012 inches.

3.3.1.1. Canteen Bearing surface.

The bottom shall have a flat bearing surface. When the canteen is set upright on a level surface it shall not rock more than 1/8 inch.

3.3.2. Canteen Cap Assembly.

The canteen cap assembly shall contain a canteen cap with a canteen cap liner.

3.3.2.1. Canteen Cap.

The cap shall be a minimum of 0.040 inches thick and shall fit the filler neck thread sufficiently tight to prevent overriding of the thread when screwed on hand tight. The hand tightened cap shall form a seal sufficiently tight to prevent water leakage from the canteen when tested as specified in 4.4.4.2.

3.3.2.1.1. Threads.

The threads for the canteen and cap shall be 38mm, 400 finish.

3.3.2.2. Canteen Cap Liner.

The liner shall be a minimum of .030 inches thick and consist of foamed polyethylene core sandwiched between two layers of solid polyethylene. The liner shall fit within the canteen cap to form a seal sufficiently tight to prevent water leakage from the canteen when tested as specified in 4.4.4.2.

3.4. Capacity.

The liquid capacity of the canteen when filled to the bottom of filler neck, shall not be less than one quart.

1. Impact resistance.

The canteen, when filled with water to the bottom of filler neck and the cap screwed on hand tight shall show no evidence of leakage when tested as specified in 4.4.4.3.

3.5. Finish.

The interior and exterior surfaces of the canteen and cap shall have a smooth and lusterless finish throughout; and shall be free of dirt, dust, grease and foreign matter. The finish shall be produced from a die which has cavity surfaces finished in vapor blast, water hone or similar satin finish and not by the application of any protective coating, lacquers or other materials. The cap shall be rough around the edge to facilitate gripping and the top shall have a smooth finish.

3.6. Workmanship.

The canteen shall be clean, smooth, well finished and free from bubbles, cracks, pinholes, dirt, warpage, blisters and scratches. The canteen shall conform to the quality of product established by this document. The occurrence of nonconformities shall not exceed the applicable acceptable quality levels established herein.

4. QUALITY ASSURANCE PROVISIONS

4.1. Responsibility for inspection.

Unless otherwise specified in the contract, or purchase order the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the document where such inspections deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1. Certificate of compliance.

Unless otherwise specified (6.2), as part of first article presentations and lot inspections, it shall be acceptable for the contractor to provide certificates of conformance for all materials and components in lieu of lot-by-lot testing. If the contractor changes component or material suppliers, a new certification based on actual test results shall be required. All certificates shall include as a minimum:

Product description, including specification, type, class, and form (when applicable)
Date of production
Production source, address, and telephone number
Production date
Lot number traceable to materials used in production

4.1.2. Certificates of Conformance Required.

Canteen Body material (3.2.1.1)
Canteen Cap material (3.2.1.2)
Canteen Cap liner material (3.2.1.3)

4.2. Inspection.

The inspection requirements specified herein are classified as follows:

First article inspection (see 4.3)
Quality conformance inspection (see 4.4)

4.3. First article inspection.

When a first article is required (see 6.2), it shall be examined for nonconformities listed in Table 1 and 4.4.3.1. The presence of any nonconformity, any dimension not within specified limits, or failure of any test shall be cause for rejection of the first article.

4.4. Quality conformance inspection.

Except as otherwise specified herein, sampling for inspection shall be performed in accordance with ANSI/ASQ Z 1.4.

4.4.1. Component and material inspection.

In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.

4.4.1.1. Material identification.

Identification of the materials for the body and cap may be accepted on the basis of a certificate of compliance for requirements specified in 3.2.1. A certificate of compliance shall be furnished with each lot stating that the body material does not contain more than 35 percent reground material and meets the requirements of the reground material as specified in 3.2.1.1.

4.4.2. In-process inspection.

When necessary, an in-process inspection shall be conducted to see that the body of the canteen is blow-molded in accordance with 3.3.1.

4.4.3. End item inspection.

The end item shall be examined for the nonconformities indicated in Table 1 and 4.4.3.1. The lot shall consist of all completely fabricated canteens offered for inspection at one time. The sample unit shall be one completely fabricated canteen. The inspection levels and the acceptable quality levels (AQLs) shall be in accordance with 4.4.3.3.

Table 1, End item inspection

Examine	Nonconformity	Major Classification	Minor Classification
Quality and finish	Color not as specified.	X	—
	Exterior surface of body and cap not smooth and not lusterless throughout.	X	—
	Inside surface of cap not smooth, including threaded portion.	X	—
	Bubbles.	—	X
	Finish produced by application of coating, lacquer, or other organic material.	X	—

	Any cut, tear, hole, burn, break, crack or mend in canteen body or canteen cap.	X	—
	Weld mark, sink mark, shrink mark, dulling of surface, roughness, or abrasion.	—	X
	Discoloration, surface deterioration, foreign inclusion, grease, orange peel, pit, rough finish, or other imperfection.	X	—
Design and construction	Objectionable odor.	X	—
	Varies from specified design and construction.	X	—
	Not fully formed.	—	X
Workmanship and assembly (general)	Evidence body is not formed by one piece blow molded process.	X	—
	Evidence of poor or inadequate mold fill.	X	—
	Any gate not trimmed flush with the molded surface.	—	X
	Component missing or operation not as specified.	X	—
Workmanship of canteen body	Weight not as specified.	X	—
	Sealing surface of lip is not flat, smooth, and free from sink marks or depression.	—	X
	Interior of neck opening not smooth, i.e., surface shredded, chipped, scratched, abraded, or otherwise impaired.	X	—
	Out of round distortion at the parting line of the closure lip prevents cap from sealing.	X	—
	Canteen rocks more than 1/8 inch when placed on a flat surface.	—	X
	Canteen body distorted resulting in weak spot at parting line.	X	—
	Flash at bottom pinch-off area on parting line extending more than 1/32 inch.	—	X
	Flash appearing on other parting lines.	—	X
Workmanship of canteen cap assembly	Sealing surface in cap is irregular, is not smooth or contains high or low points.	X	—
	Canteen cap liner not included in canteen cap.	X	—
	Outside parting line on canteen cap other than line only.	—	X
	Flash appearing on parting line.	—	X
	Canteen cap will not screw onto canteen	X	—
	Cap binds when screwing onto canteen	X	—
	Evidence that the canteen cap does not seal when engaged on canteen.	X	—
Workmanship of threads	Threads in cap or on body neck stripped, not permitting tight closure.	X	—
	Canteen neck or canteen cap does not contain 1 full turn of thread.	X	—
	Threads improperly gaged or improperly aligned on component preventing seal at closure.	X	—

	Threads not fully formed, not free from flash, misaligned at parting line or other imperfection.	X	—
Cleanliness	Dirt, grease, dust, or other foreign matter on inside or outside of canteen.	X	—
	Plastic shavings on the inside of canteen.	—	X

4.4.3.1. Dimensional examination.

The canteens shall be examined for nonconformities in wall thickness as specified in 4.4.3.1.1 and for other dimensional nonconformities as specified in 4.4.3.1.2 and Drawing NTDP-1172. The sample unit for each examination shall be one canteen.

4.4.3.1.1. Examination for wall thickness.

For this examination, the canteens shall be cut in half along the parting line and each half cut 90º to the parting line to give four quarters. Measurements to the nearest 0.001 inch shall be made at the thinnest area of each quarter. A failure of any sample unit to meet the requirements shall be scored as a nonconformity.

4.4.3.1.2. Examination for dimensions other than wall thickness.

For this examination, all canteen dimensions other than wall thickness shall be measured. Caps shall be measured for wall and liner thickness. Any dimension that is not within the specified tolerances shall be classified a nonconformity.

4.4.3.2. Inspection levels and AQLs.

The inspection levels and AQLs expressed in nonconformities per hundred units shall be as follows:

Paragraph	Inspection Level	Major AQL	Total AQL
Table 1	I	4.0	10.0
4.4.3.1.1	I	one class	1.0
4.4.3.1.2	S-2	one class	6.5

4.4.4. End item testing.

Testing shall be for completely fabricated canteens. The sample unit shall be one completely fabricated canteen with cap. The sample size for the designated lot size shall be as shown below. There shall be no evidence of failure of any sample unit to meet the requirements as specified.

Lot size	Sample size
800 or less	2
801 to 22000	3
22001 and over	5

4.4.4.1. Taste Test.

The finished canteens shall be thoroughly rinsed with distilled water. Then the canteen shall be filled to the bottom of the filler neck with distilled water and allowed to set at room temperature for a minimum of 8 hours. Any noticeable taste to the water shall constitute failure.

4.4.4.2. Cap sealing test.

The canteens shall be filled with water to the bottom of the filler neck and the cap screwed on hand tight. The canteen shall be cloth dried and shall be turned upside down for 3 minutes. The canteen shall not be held by or set on the cap. Any evidence of leakage shall be classified as a failure. The canteen used for this test may be used for the impact test (4.4.4.3).

4.4.4.3. Impact test.

The canteens shall be filled to the bottom of the filler neck with water and the cap screwed on hand tight. The canteen shall be dropped, with filler neck up, from a height of 3 feet to the impact surface. The impact surface shall be dry clean concrete. The canteen shall then be examined for any evidence of fracturing or leakage of the cap or body. Leakage or fracturing shall constitute failure.

4.4.5. Packaging inspection.

An examination shall be made to determine that packing and marking comply with the section 5 requirements. Nonconformities shall be scored in accordance with table 2. The sample unit shall be one shipping container fully packaged except that it shall not be palletized and it need not be closed. Shipping containers fully packaged that have not been palletized shall be examined for nonconformities in closure. The lot size shall be the number of shipping containers in the end item inspection lot. The inspection level shall be S-2 and the AQL shall be 2.5 nonconformities per hundred units.

Table 2—Packaging inspection

Component	Nonconformity
Markings	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing or not as specified. Any component damaged, affecting serviceability.
Workmanship	Inadequate application of components, such as incomplete closure of container flaps, improper taping, loose strapping, or inadequate stapling. Bulged or distorted container.
Contents	Number of items per container is more or less than required.

5. PACKAGING

5.1. Preparation

Each canteen shall have one cap assembly screwed on finger tight

5.2. Packing.

One hundred (100) prepared canteens shall be packed in a close-fitting corrugated fiberboard box, minimum burst strength 200 psi (ETC 32), meeting the requirements of ASTM D 5118. Boxes shall be National Motor Freight Classification. Before closing, a flat corrugated fiberboard insert shall be placed on top of the canteens. Each box shall be closed in accordance with the latest version of ASTM D 1974.

5.3. Marking.

In addition to any special marking required by the contract or purchase order, shipping containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1. Intended use.

The canteen is intended primarily for use by wildland firefighters for carrying drinking water.

6.2. Ordering data.

a. Acquisition documents should specify the following:
b. Title, number, and date of this document.
c. When first articles are not required for inspection and approval (see 3.1, 4.3 and 6.4).

6.3. Material shrinkage.

Since the shrinkage characteristics of plastic materials are well recognized, it is the responsibility of the contractor to compensate for this factor in mold design in order to produce and supply a finished product in accordance with Drawing NTDP-1176.

6.4. First article.

When first articles are required, they shall be inspected and approved under the appropriate provisions of the contract. The first articles shall consist of three completed canteens. The contracting officer should include specific instructions in all acquisition documents, regarding arrangements for selection, inspection, and approval of the first articles.

6.5. Recycled material.

It is encouraged that recycled material be used when practical as long as it meets the requirements of this document (see 3.2).

6.6. Preparing activity.

USDA Forest Service, National Technology and Development Program, 5785 Hwy 10 West, Missoula, MT 59808.